

## Excercises

2.1

(Converting Fahrenheit to Celsius) Write a program that reads a Fahrenheit degree in double from an input dialog box, then converts it to Celsius and displays the result in a message dialog box. The formula for the conversion is as follows:

$$\text{celsius} = (5/9) * (\text{fahrenheit} - 32)$$

Hint

In Java,  $5 / 9$  is 0, so you need to write  $5.0 / 9$  in the program to obtain the correct result.

2.2

(Computing the volume of a cylinder) Write a program that reads in the radius and length of a cylinder and computes its volume using the following formulas:

$$\text{area} = \text{radius} * \text{radius} * \pi$$

$$\text{volume} = \text{area} * \text{length}$$

2.3

(Converting feet into meters) Write a program that reads a number in feet, converts it to meters, and displays the result. One foot is 0.305 meters.

2.4

(Converting pounds into kilograms) Write a program that converts pounds into kilograms. The program prompts the user to enter a number in pounds, converts it to kilograms, and displays the result. One pound is 0.454 kilograms.

2.5\*

(Calculating tips) Write a program that reads the subtotal and the gratuity rate, and computes the gratuity and total. For example, if the user enters 10 for subtotal and 15% for gratuity rate, the program displays \$1.5 as gratuity and \$11.5 as total.

[Page 64]

2.6\*\*

(Summing the digits in an integer) Write a program that reads an integer between 0 and 1000 and adds all the digits in the integer. For example, if an integer is 932, the sum of all its digits is 14.

Hint

Use the % operator to extract digits, and use the / operator to remove the extracted digit. For instance,  $932 \% 10 = 2$  and  $932 / 10 =$

93

Java Exercises

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Q1

(Summing a series) Write a program to sum the following series:

$$\frac{1}{3} + \frac{3}{5} + \frac{5}{7} + \frac{7}{9} + \frac{9}{11} + \frac{11}{13} + \dots + \frac{95}{97} + \frac{97}{99}$$

Q2

Finding the largest  $n$  such that  $n^3 < 12000$  ) Use a while loop to find the largest integer  $n$  such that  $n$  is less than 12,000.

Q3

(Finding the factors of an integer) Write a program that reads an integer and displays all its smallest factors. For example, if the input integer is 120, the output should be as follows: 2, 2, 2, 3, 5.

## Java method questions

Q1-

(Finding the smallest element) Write a method that finds the smallest element in an array of integers. Use {1, 2, 4, 5, 10, 100, 2, -22} to test the method

Q2-

Write a program that generates one hundred random integers between 0 and 9 and displays the count for each number. Hint: Use `(int)(Math.random() * 10)` to generate a random integer between 0 and 9. Use an array of ten integers, say `counts`, to store the counts for the number of 0's, 1's, ..., 9's.

Q3

(Computing deviation) Exercise 5.21 computes the standard deviation of numbers. This exercise uses a different but equivalent formula to compute the standard deviation of  $n$  numbers

$$\text{mean} = \frac{\sum_{i=1}^n x_i}{n} = \frac{x_1 + x_2 + \dots + x_n}{n} \quad \text{deviation} = \sqrt{\frac{\sum_{i=1}^n (x_i - \text{mean})^2}{n - 1}}$$

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